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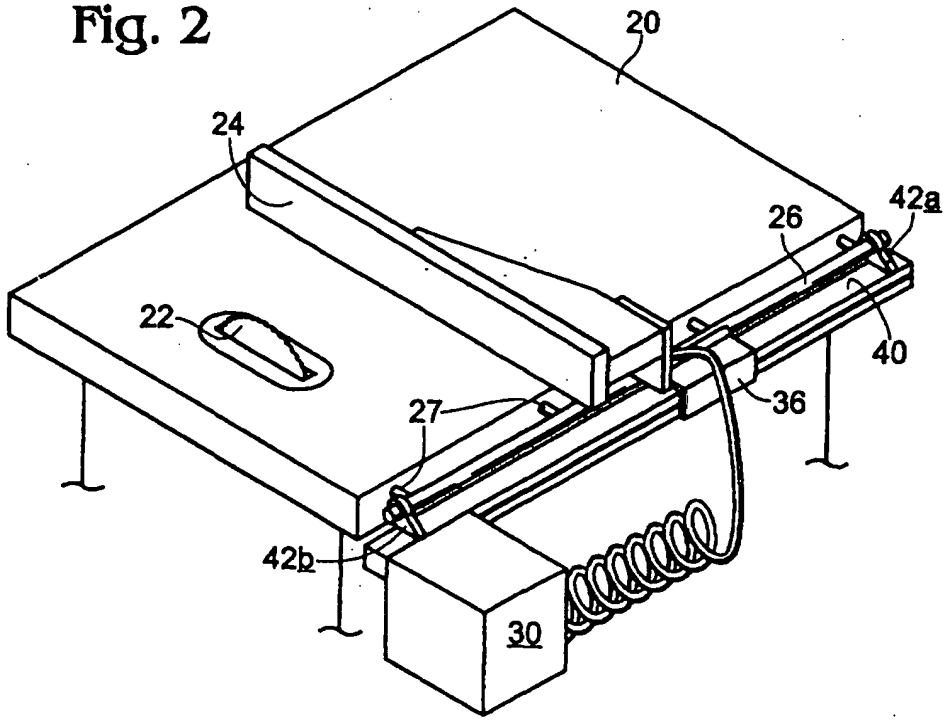
(54) System for coupling a control device to the guide fence of a saw table

(57) A digital fence positioning system is mounted to a preexisting table saw by clamping the digital fence positioning system directly to the fence rail. A clamping device includes two clamps positioned near opposite ends of a guide rail for a fence. Each clamp has top and bottom portions that can be secured to encompass a circular surface of the guide rail.

Fig. 2



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Description

Field of the Invention

[0001] The invention relates to saws. In particular, the invention involves an after-market accessory for mounting a digital fence positioning system on a table saw.

Background of the Invention

[0002] Table saws are often equipped with a moveable fence to allow the operator to set desired cut dimensions. Table saw fences typically are moveable along a guide rail that is bolted along one side of the table saw. An operator can slide the fence back and forth along the guide rail and then lock the fence in place by means of a locking handle. Many such table saws are sold in a design that requires manual adjustment of the fence.

Sometimes it is desirable to use a table saw in an automated or semi-automated capacity. Digital positioning systems are available for adding onto a table saw that has a manually operable fence. After market automated fence positioning systems may be cumbersome to install. Some positioning systems require replacement of the fence and the rail. Such an overhaul procedure is time consuming and may require a relatively high level of mechanical skill.

Another type of automated fence positioning system is designed for mounting on a preexisting rail, and for use with the preexisting fence and positioning clamp. This approach requires the purchaser to bolt the positioning system to the table via brackets. Mounting of the positioning system on the saw can be challenging because it is critical that the positioner guide rail be aligned precisely in parallel with the preexisting fence rail. It can be difficult and time consuming to achieve proper alignment of the positioning guide and the fence rail.

Another problem with prior automated fence positioning systems is that different table saws have different table and bolt configurations so that one bracket design may not be universally functional to mount the system on different saw configurations.

Summary of the Invention

[0003] The invention provides a system and method for adding an automated fence positioning system to a preexisting table saw. The fence positioning system operates with a preexisting fence and associated guide rail for directing movement of the fence.

[0004] According to a first aspect of the invention there is provided a control device for operating a fence on a table saw having a first rail that guides movement of a fence , comprising a fence controller having a fence positioner connected to the fence and a second rail that guides movement of the positioner and a clamp device joining the second rail directly to opposite ends of the first rail.

[0005] Preferably, the clamp device is removable and preferably it holds the second guide rail in parallel with the first rail without interfering with a functional range of movement of the fence back and forth along the first rail. In one embodiment the clamp device connects the second rail directly to the first rail.

[0006] Preferably, the clamp device has at least two clamps designed to be fastened at opposite ends of the first rail. The clamping device preferably extends diagonally downward from the first rail

[0007] Preferably, the fence controller comprises a drive mechanism connected to the fence for automatically moving the fence along the first rail, wherein the drive mechanism includes the fence positioner. Preferably, the drive mechanism includes a computer and a keypad for inputting information into the computer for determining the dimension of wood to be cut on the table saw. In one embodiment, the drive mechanism has a processor that determines where to move the fence based on information input through the keypad and more preferably the processor is capable of memorizing one or more cut lists and/or is capable of optimizing a cut routine based on a desired cut list entered and information concerning available raw materials. Preferably, the processor determines where to move the fence based on information input through the keypad and preferably the processor is capable of memorizing common cut lengths and carrying out movement of the fence to a preprogrammed position in response to manual contact of a single key on the keypad.

[0008] Preferably, the second rail is in the form of a rectangular tube having a linear channel and preferably it has a top side, the clamp device being rigidly connected to the top side of the second rail.

[0009] In one embodiment the invention comprises a table saw and a fence control device as hereinbefore described.

[0010] In one embodiment of the invention there is provided a linkage device for directly connecting first and second rigid longitudinal members comprising a plurality of clamps, each clamp having a lower portion and an upper portion, wherein the lower portion has a planar bottom surface for fixedly contacting an upper planar surface of the first longitudinal member, and a top semicircular surface for fixedly contacting a lower surface of the second longitudinal member, and wherein the upper portion of each clamp has a bottom semicircular surface corresponding to the top semicircular surface of the lower portion, so that the semicircular surfaces of each clamp can cooperatively encompass a circular surface of the second longitudinal member.

[0011] The present invention also provides an automated fence positioning system comprising clamp devices with releasable fastening means that are easy to mount and optionally demount from a table saw or the like. The invention thus further includes a clamp on system which is particularly advantageous in that it facili-

tates use and may be used with a variety of different saw configurations.

[0012] A typical positioning system includes a controller mounted in a fixed position on a separate positioner guide rail or channeling member, and a fence mover or positioner that is connected to the fence. The positioner moves along the positioner guide rail, and is operated by the controller. The positioner guide rail is directly clamped to opposing ends of the preexisting fence rail. The direct clamping mechanism allows the rails to be aligned easily in a parallel relationship so that the fence positioning system functions properly.

Description of the Figures

[0013]

Figure 1 is a perspective view of a table saw with an after-market automated fence positioning system.

Figure 2 is a perspective view of a table saw with the positioner guide rail for the fence mover clamped directly to the preexisting fence rail, in accordance with a preferred embodiment of the invention.

Figure 3 is a side view of the table saw shown in Figure 2.

Figure 4 is a close-up of the clamp and rail portions of the saw shown in Figures 1 and 2.

Description of the Invention

[0014] The invention provides a simplified system and method for adding an automated fence positioning system to a preexisting table saw. In particular, the invention allows a person to mount a digital fence positioning device to a table saw without dismantling the table saw, and without encountering significant difficulties aligning the fence positioner with the preexisting fence rail. The invention enables a person having less mechanical skill then was previously required, to install a fence positioning device.

Figure 1 shows a table saw and automated fence-positioning device. Figures 2-4 show details of an improved mechanism for mounting an automated fence-positioning device on a table saw. In particular, Figures 2-4 show a pair of clamps that directly join the fence controller device to the preexisting rail for the fence.

In Figure 1, table 20 employs circular saw 22 to cut wood, plastic, metal, composite, or other material in direction 23. Fence 24 is moveable back and forth in direction 25 along fence rail 26. Fence rail 26 is connected to table 20 by cross supports 27. An accessory device is added to table saw 20 to control automatically the position of fence 24 in direction 25, thus determining a dimension to cut lumber. The fence controller 29 may include a computer and a keyboard mounted on or near table 20. A drive motor and amplifier are contained in housing 30 which is connected in a fixed location to positioner guide rail 32. Positioner guide rail 32 is connected to table 20 via brackets 34 that mount on to cross supports 27. Fence positioner 36 is connected to the drive motor via cable 38. Fence positioner 36 is rigidly connected to fence 24, and is moveable, per instruction from controller 30, along positioner guide rail 32.

Figure 2 shows a preferred embodiment of the invention in which many of the elements of table saw 20 are the same as shown in Figure 1. In Figure 2 positioner guide rail 40 is connected directly to fence rail 26 via clamps 42a and 42b. Importantly, clamps 42a and 42b are connected to fence rail 26 at extreme opposite ends of fence rail 26 so as not to interfere with the functioning movement offence 24 in normal operation.

As shown in Figures 2-4, clamps 42a and 42b are configured to extend in a downwardly diagonal orientation so that the fence controller device is ultimately positioned outward and down slightly from table 20 and fence rail 26.

Figure 3 shows a side view of the table in Figure 2. Figure 4 shows a portion of Figure 3 expanded to focus on clamp 42a for connecting positioner guide rail 32 directly to fence rail 26. Clamp 42a has lower portion 50 that is bolted to upper portion 52. Bolt holes are shown in dashed lines. Specifically, bolt holes 54a and 54b are provided for coupling lower portion 50 of clamp 42a to positioner guide rail 32. Bolt holes 56a and 56b are provided for coupling upper portion 52 of clamp 42a to lower portion 50. When the digital fence controller device is properly installed, interface line 60 between upper portion 52 and lower portion 50 of clamp 42a is substantially horizontal or parallel to the surface of table 20.

Clamps 42a and 42b allow a person having minimal mechanical skill easily to mount a digital fence controlling system without dismantling preexisting hardware. Precise alignment of the positioner guide rail in parallel with the fence rail is achieved simply by bolting the clamps on to opposite ends of the fence rail.

Although the invention has been disclosed in its preferred forms, the specific embodiments thereof as disclosed and illustrated herein are not to be considered in a limiting sense, because numerous variations are possible. Singular terms used herein do not preclude the use of more than one of the associated element, and embodiments utilizing more than one of a particular element are within the scope of the invention. Applicant regards the subject matter of his invention to include all novel and nonobvious combinations and subcombinations of the various elements, features, functions, and/or properties disclosed herein. No single feature, function, element or property of the disclosed embodiments is essential. The following claims define certain combinations and subcombinations of features, functions, elements, and/or properties that are regarded as novel and nonobvious. Other combinations and subcombinations may be claimed through amendment of the present claims or presentation of new claims in this or a related

application. Such claims, whether they are broader, narrower, equal, or different in scope to the original claims, also are regarded as included within the subject matter of applicant's invention.

[0015] The Invention further includes the subject matter of the following paragraphs:

[0016] A control device for operating a fence on a table saw, comprising:

> a drive mechanism connected to a fence for automatically moving the fence along a fence rail structure, wherein the drive mechanism includes a fence positioner connected to the fence, and a positioner guide rail for coordinating movement of the fence positioner, and
> a removable clamp device that rigidly connects the drive mechanism directly to the fence rail structure.

[0017] The clamp device holds the positioner guide rail in parallel with the fence rail structure without interfering with a functional range of movement of the fence back and forth along the fence rail structure.

[0018] The clamp device connects the positioner guide rail directly to the fence rail structure.

[0019] The clamp device has at least two clamps designed to be fastened at opposite ends of the fence rail structure.

[0020] The drive mechanism includes a computer and a keypad for inputting information into the computer for determining the dimension of wood to be cut on the table saw.

[0021] The drive mechanism has a processor that determines where to move the fence based on information input through the keypad.

[0022] The processor is capable of memorizing one or more cut lists and is capable of optimizing a cut routine based on a desired cut list entered and information concerning available raw materials.

[0023] The processor and the keypad are capable of carrying out calculations.

[0024] The processor is capable of memorizing common cut lengths and carrying out movement of the fence to a preprogrammed position in response to manual contact of a single key on the keypad.

[0025] A table saw having a first rail that guides movement of a fence,

> a fence controller having a positioner connected to the fence and a second rail that guides movement of the positioner, and
> a clamp device joining the second rail directly to opposite ends of the first rail.

[0026] The clamp device includes two clamp members, each clamp member having a top and bottom portion configured to grip cooperatively a portion of a cylindrical rail.

[0027] The clamping device extends diagonally downward from the fence rail.

[0028] The second rail is in the form of a rectangular tube having a linear channel.

[0029] The second rail has a top side, the clamp device being rigidly connected to the top side of the second rail.

[0030] A linkage device for directly connecting first and second rigid longitudinal members comprising

> a plurality of clamps, each clamp having a lower portion and an upper portion, wherein the lower portion has a planar bottom surface for fixedly contacting an upper planar surface of the first longitudinal member, and a top semicircular surface for fixedly contacting a lower surface of the second longitudinal member, and
> wherein the upper portion of each clamp has a bottom semicircular surface corresponding to the top semicircular surface of the lower portion, so that the semicircular surfaces of each clamp can cooperatively encompass a circular surface of the second longitudinal member.

Claims

1. A control device for operating a fence on a table saw (20) having a first rail (26) that guides movement of a fence (24), comprising

   > a fence controller (29) having a fence positioner (36) connected to the fence (24) and a second rail that guides movement of the positioner (36), and
   > a clamp device (27, 34, 42a, 42b) joining the second rail directly to opposite ends of the first rail.

2. The device of claim 1 wherein the clamp device (42a, 42b) is removable.

3. The control device of either preceding claim wherein the fence controller comprises a drive mechanism (29, 30, 36, 38) connected to the fence (24) for automatically moving the fence along the first rail (26), wherein the drive mechanism includes the fence positioner (36).

4. The device according to any preceding claim, wherein the clamp device holds the second guide rail (32, 40) in parallel with the first rail (26) without interfering with a functional range of movement of the fence (24) back and forth along the first rail (26).

5. The device according to any preceding claim, wherein the clamp device (42a, 42b) connects the second rail (32, 40) directly to the first rail (26).

6. The device according to any preceding claim, wherein the clamp device has at least two clamps (42a, 42b) designed to be fastened at opposite ends of the first rail (26).

7. The device according to any preceding claim, wherein the clamping device extends diagonally downward from the first rail.

8. The device according to any preceding claim, wherein the second rail (32, 40) is in the form of a rectangular tube having a linear channel.

9. The device according to any preceding claim, wherein the second rail (32, 40) has a top side, the clamp device being rigidly connected to the top side of the second rail.

10. The device according to any preceding claim, wherein the drive mechanism includes a computer and a keypad for inputting information into the computer for determining the dimension of wood to be cut on the table saw.

11. The device of claim 10, wherein the drive mechanism has a processor (29) that determines where to move the fence based on information input through the keypad.

12. The device of claim 11, wherein the processor is capable of memorizing one or more cut lists and/or is capable of optimizing a cut routine based on a desired cut list entered and information concerning available raw materials.

13. The device of either claim 11 or claim 12, wherein the processor is capable of memorizing common cut lengths and carrying out movement of the fence to a preprogrammed position in response to manual contact of a single key on the keypad.

14. A table saw (20) comprising a fence control device according to any preceding claim.

15. A linkage device (27, 34, 42a, 42b) for directly connecting first (26) and second rigid longitudinal members (32, 40) comprising

a plurality of clamps (42a, 42b), each clamp having a lower portion (52) and an upper portion (50), wherein the lower portion has a planar bottom surface for fixedly contacting an upper planar surface of the first longitudinal member (26), and a top semicircular surface for fixedly contacting a lower surface of the second longitudinal member (32, 40), and
wherein the upper portion of each clamp (42a, 42b) has a bottom semicircular surface corresponding to the top semicircular surface of the lower portion, so that the semicircular surfaces of each clamp can cooperatively encompass a circular surface of the second longitudinal member (32, 40).

Fig. 1

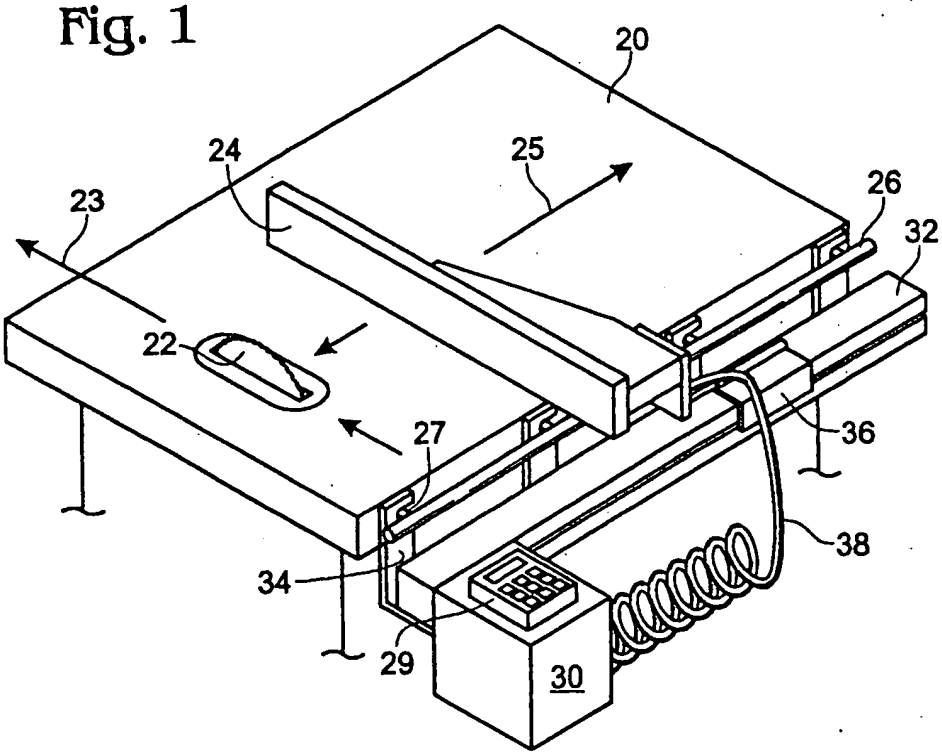

Fig. 2

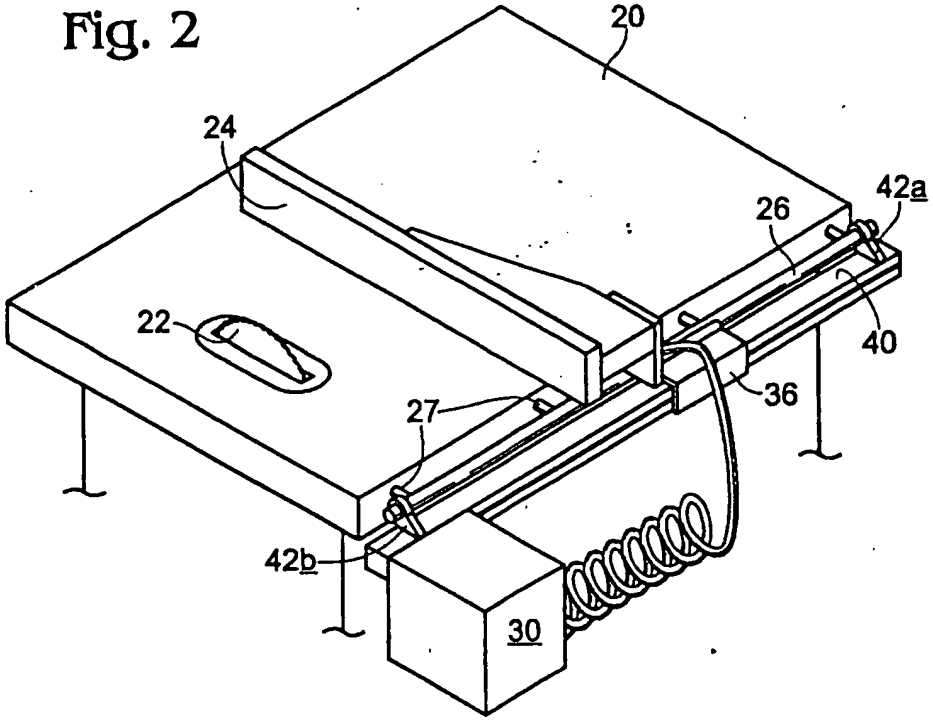

Fig. 3

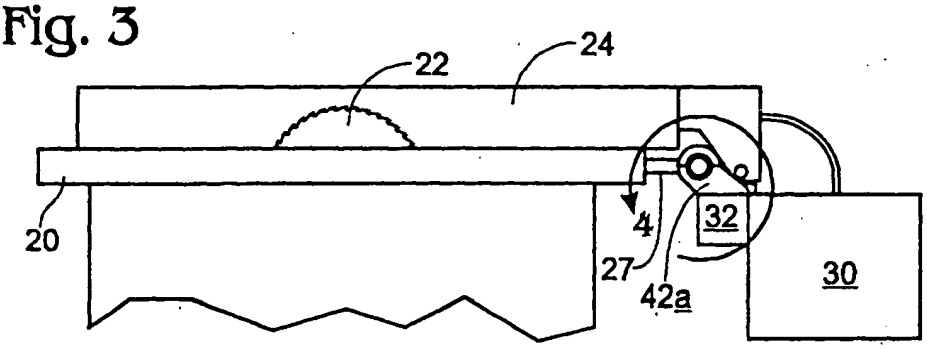

Fig. 4